CLAIMS

1. A retroreflective display device equipped with radio frequency identification unit or units, which comprises at least a surface-protective layer, information display layer, retroreflective layer and a back-protective layer, and is characterized in that one or more radio frequency identification units each enclosing radio frequency identification integrated circuit are provided on or between these layers and one or more communication antennas connected to said radio frequency identification integrated circuits are provided.

2. A retroreflective display device equipped with radio frequency identification unit or units as described in Claim 1, in which said communication antenna or antennas are provided on the back of the reflective surface of a retroreflective element.

3. A retroreflective display device as described in Claim 1, in which said communication antenna or antennas are provided on the reflective surface of a retroreflective element.

4. A retroreflective display device as described in any one of Claims 1 – 3, in which said retroreflective element is constructed of a large number of cube-corner prismatic retroreflective units.

5. A retroreflective display device as described in Claim 4, in which said cube-corner prismatic retroreflective element units are constructed of internal total reflection type cube-corner prisms.

6. A retroreflective display device as described in Claim 4, in which said cube-corner prismatic retroreflective element is constructed of specular reflection type cube-corner prisms which are formed of cube-corner prisms and a metallic thin film layer provided thereon.

7. A retroreflective display device as described in any one of

Claims 1 – 3, in which said retroreflective element is constructed of a large number of micro glass bead-type retroreflective units.

8. A retroreflective display device as described in Claim 7, in which said micro glass bead-type retroreflective element is formed of the micro glass bead-type units and a metallic thin film layer provided thereon.

9. A retroreflective display device as described in Claim 7, in which said micro glass bead-type retroreflective element is formed of the micro glass bead-type units and a metallic thin film layer provided thereon via a thin resin film layer.

10. A retroreflective display device as described in any one of Claims 6, 8 and 9, in which said metallic thin film layer provided on said cube-corner prisms or micro glass bead units does not form a continuous layer but is divided into electrically insulated lots.

11. A retroreflective display device as described in Claim 10, in which said metallic thin film layer provided on the micro glass bead units does not form a continuous layer between said micro glass bead units but is divided to form electrically insulated micro glass bead units independently of each other.

12. A retroreflective display device as described in Claim 10 or 11, in which the metallic thin film layer does not form a continuous layer on at least those cube-corner prisms or micro glass bead units located in the region or regions on which communication antenna or antennas are installed, but is divided into electrically insulated lots.

13. A retroreflective display device as described in Claim 12, in which the metallic thin film layer, which is provided on at least the cube-corner prisms or micro glass bead units which are located in the region or regions on which said communication antenna or antennas are installed, is removed.

14. A retroreflective display device as described in any one of Claims 1 – 13, in which at least two radio frequency identification units each enclosing radio frequency identification integrated circuit or circuits with communication antenna or antennas installed thereon are provided, said radio frequency identification units being connected with electric circuits so that common electronic informations are stored in said electronic identification units.

15. A retroreflective display device as described in any one of Claims 1 – 14, in which two or more radio frequency identification units each enclosing radio frequency identification integrated circuit or circuits with communication antennas installed thereon are provided, said radio frequency identification units having different propagation frequencies from each other.

16. An internally illuminated retroreflective display device equipped with radio frequency identification unit or units, which is a retroreflective display device comprising at least a surface-protective layer, information display layer, retroreflective layer and a back-protective layer, having one or more radio frequency identification units on or between said layers, said radio frequency identification unit enclosing radio frequency identification integrated circuit or circuits and having one or more communication antennas installed as connected to said radio frequency identification integrated circuits; characterized in that it has an internally illuminated sign structure wherein an illuminator is disposed at the back of said retroreflective layer, said retroreflective layer being retroreflective to the light coming from the front of the sign and transmissive to the light from the interior of said sign, said structure comprising said surface-protective layer, information display layer, retroreflective layer, back-protective layer, a radio frequency identification unit or units, an illuminator, and a housing to enclose and support the foregoing.

17. An internally illuminated retroreflective display device as described in Claim 16, in which said communication antenna or antennas are formed at the back of the reflective surface of a retroreflective element.

18. An internally illuminated retroreflective display device as described in Claim 16, in which said communication antenna or antennas are formed on the reflective surface of the retroreflective element.

19. An internally illuminated retroreflective display device as described in any one of Claims 16-18, in which the retroreflective element constituting said retroreflective layer is composed of cube-corner prismatic retroreflective units.

20. An internally illuminated retroreflective display device as described in Claim 19, in which said cube-corner prismatic retroreflective units are composed of internal total reflection type cube-corner prisms.

21. An internally illuminated retroreflective device as described in Claim 19, in which said cube-corner prismatic retroreflective units are composed of specular reflection type cube-corner prisms formed of said cube-corner prisms and a metallic thin film layer partially laid thereon with an areal ratio of less than 80%.

22. An internally illuminated retroreflective display device as described in any one of Claims 19 – 21, in which said cube-corner prismatic retroreflective units are at least of one type of cube-corner prismatic retroreflective units selected from the group consisting of triangular pyramidal cube-corner units, full cube-type cube-corner units, tent-type cube-corner units and cross-prismatic units.

23. An internally illuminated retroreflective display device as described in any one of Claims 16 – 18, in which the retroreflective

element constituting the retroreflective layer is composed of micro glass bead-type retroreflective units.

24. An internally illuminated retroreflective display device as described in Claim 23, in which said micro glass bead-type retroreflective units are composed of the micro glass bead-type units and a metallic thin film layer partially laid thereon at an areal ratio of less than 80%.

25. An internally illuminated retroreflective display device as described in any one of Claims 21 – 24, in which said metallic thin film layer partially laid on the cube-corner prisms or micro glass bead-type units at an areal ratio of less than 80% does not form a continuous layer but is divided into electrically insulated lots.

26. An internally illuminated retroreflective display device as described in any one of Claims 16 – 25, in which said illuminator used in the retroreflective, internally illuminated sign is either back-projector type or side-projector type illuminator.

27. An electroluminescence internally illuminated retroreflective display device equipped with a radio frequency identification unit or units, which is a retroreflective display device comprising at least a surface-protective layer, information display layer, retroreflective layer and a back-protective layer, having one or more radio frequency identification units on or between said layers, said radio frequency identification unit enclosing radio frequency identification integrated circuit or circuits and having one or more communication antennas installed as connected to said radio frequency identification integrated circuits; characterized in that an illuminator according to the principle of electroluminescence is disposed at the back of the retroreflective layer, said retroreflective layer being retroreflective to the light coming from the front of the sign and transmissive to the light from the interior of the sign.

28. An electroluminescence internally illuminated retroreflective display device as described in Claim 27, in which said communication antenna or antennas are formed on the back of the reflective surface of the retroreflective element.

29. An electroluminescence internally illuminated retroreflective display device as described in Claim 27, in which said communication antenna or antennas are formed on the retroreflective surface of the retroreflective element.

30. An electroluminescence internally illuminated retroreflective display device as described in any one of Claims 27 – 29, in which the retroreflective element constituting the retroreflective layer is composed of cube-corner prismatic retroreflective units.

31. An electroluminescence internally illuminated retroreflective display device as described in Claim 30, in which said cube-corner prismatic retroreflective units are composed of internal total reflection type cube-corner prisms.

32. An electroluminescence internally illuminated retroreflective display device as described in Claim 30, in which said cube-corner prismatic retroreflective units are composed of specular reflection type cube-corner prisms formed of said cube-corner prisms and a metallic thin film layer partially laid thereon with an areal ratio of less than 80%.

33. An electroluminescence internally illuminated retroreflective display device as described in any one of Claims 30 – 32, in which said cube-corner prismatic retroreflective units are at least of one type of cube-corner prismatic retroreflective units selected from the group consisting of triangular pyramidal cube-corner units, full cube-type cube-corner units, tent-type cube-corner units and cross-prismatic units.

34. An electroluminescence internally illuminated retroreflective display device as described in any one of Claims 27 – 29, in which the retroreflective element constituting the retroreflective layer is composed of micro glass bead-type retroreflective units.

35. An electroluminescence internally illuminated retroreflective display device as described in Claim 34, in which said micro glass bead-type retroreflective units are composed of the micro glass bead-type units and a metallic thin film layer partially laid thereon at an areal ratio of less than 80%.

36. An electroluminescence internally illuminated retroreflective display device as described in any one of Claims 32 – 35, in which said metallic thin film layer partially laid on the cube-corner prisms or micro glass bead-type units at an areal ratio of less than 80% does not form a continuous layer but is divided into electrically insulated lots.